

What is claimed is:

1. An acceleration detector for detecting impact acceleration from an amount of displacement of a mass member constructed to be displaced according to an applied impact acceleration, comprising:

a mass member arranged to be displaced in a direction corresponding to each of the impact accelerations applied in two directions, by an amount of displacement corresponding to the size of the impact acceleration from a predetermined position; and

detection means for detecting a state of displacement of the mass member by a predetermined amount or more as a keying signal and outputting the keying signal.

2. An acceleration detector according to claim 1, wherein said mass member includes: a first mass member arranged to be displaced in a direction corresponding to a first direction, in which impact acceleration is applied, and displaced linearly from a predetermined position corresponding to the size of the impact acceleration; and a second mass member arranged to be displaced in a direction corresponding to a second direction opposite the first direction, in which the impact acceleration is applied, and displaced linearly from a predetermined position corresponding to the size of the above-mentioned impact acceleration, and said detection means includes: first detection means for detecting a state of displacement of the first mass member by a predetermined amount or more as a keying signal, and outputting the keying signal; and second detection means for detecting a state of displacement of the second mass member by a predetermined amount or more as a keying signal, and outputting the keying signal.

3. An acceleration detector according to claim 2, wherein said first detection means is a switch mechanism which is mechanically closed by the displacement of the first mass

member by a predetermined amount or more to detect the displaced state of the first mass member by the predetermined amount or more as a keying signal and output the keying signal, said switch mechanism including: a movable piece provided integrally with the first mass member, and a pair of fixed contacts provided in a housing side to be brought into contact with the movable piece, and said second detection means is a switch mechanism, which is mechanically closed by the displacement of the second mass member by a predetermined amount or more to detect the displaced state of the second mass member by a predetermined amount or more as a keying signal and output the keying signal, said switch mechanism of the second detection means including: a movable piece provided integrally with the second mass member, and a pair of fixed contacts provided in a housing side to be brought into contact with the movable piece.

4. An acceleration detector according to claim 3, further comprising: return means for returning the first and second mass members to predetermined positions.

5. An acceleration detector according to claim 4, wherein said first mass member is arranged to be displaced linearly along a shaft body in a direction corresponding to the first direction, in which the impact acceleration is applied, said second mass member is arranged oppositely to the first mass member to be displaced linearly along the shaft body in a direction corresponding to the second direction opposite the first direction, in which the impact acceleration is applied, and said return means is a spring member having a spring constant, provided between the first and second mass members arranged to be displaced linearly along the shaft body, and adapted to convert impact acceleration of a predetermined size or larger into an amount of displacement of the first or second mass member, enabling the impact acceleration to be detected as a keying signal.

6. An acceleration detector according to claim 5, wherein said first and second mass members comprise buffer members in opposite end surfaces, each buffer member being provided to reduce impacts when one of the first and second mass members is displaced along the shaft body toward the other of the first and second mass members, and the first and second mass members are abutted on each other.

7. An acceleration detector according to claim 6, wherein said spring member is provided between the first and second mass members to be prevented from being fully compressed when one of the first and second mass members is displaced along the shaft body toward the other of the first and second mass members, and the buffer members of the first and second mass members are abutted on each.

8. An acceleration detector according to claim 1, wherein said mass member includes: a first mass member arranged to be displaced in a direction corresponding to the first direction, in which the impact acceleration is applied, and displaced from a predetermined position corresponding to the size of the impact acceleration, and capable of giving an effect of a magnetic field to the outside; and a second mass member arranged to be displaced in a direction corresponding to a second direction opposite the first direction, in which the impact acceleration is applied, displaced from a predetermined position corresponding to the size of the impact acceleration, and capable of giving an effect of a magnetic field to the outside, and said detection means is magnetic switch detecting means for detecting a state of displacement of the first or the second mass member by a predetermined amount or more as a keying signal upon receiving the effect of the magnetic field given by the first or second mass member.

9. An acceleration detector according to claim 8, further comprising: return means for returning the first and

second mass members to predetermined positions.

10. An acceleration detector according to claim 9, wherein said first mass member is arranged to be displaced linearly along the shaft body in a direction corresponding to the first direction, in which the impact acceleration is applied, said second mass member is arranged to be displaced linearly along the shaft body in a direction opposite the first direction, in which the impact acceleration is applied, and said return means is a spring member having a spring constant provided between the first and second mass members arranged to be displaced linearly along the shaft body, and enabling to detect the impact acceleration of a predetermined size or larger according to the amount of displacement thereof.

11. An acceleration detector according to claim 10, wherein said first and second mass members comprise buffer members in opposite end surfaces, each buffer member being provided to reduce impacts when one of the first and second mass members is displaced along the shaft body toward the other of the first and second mass members, and the first and second mass members are abutted on each other.

12. An acceleration detector according to claim 11, wherein said spring member is provided between the first and second mass members to be prevented from being fully compressed when one of the first and second mass members is displaced along the shaft body toward the other of the first and second mass members, and the buffer members of the first and second mass members are abutted on each other.

13. An acceleration detector according to claim 1, wherein said mass member is of a pendulum type to be supported rotatably in a direction corresponding to the first or second direction, in which the impact acceleration is applied, and

rotated from a predetermined position in a clockwise or counterclockwise direction according to the size of the impact acceleration applied in the first second direction, and said detection means includes: first detection means for detecting a rotated state of the pendulum type mass member by a predetermined amount in the clockwise direction as a keying signal; and second detection means for detecting a rotated state of the pendulum type mass member by a predetermined amount in the counterclockwise direction as a keying signal.

14. An acceleration detector according to claim 13, wherein said first detection means is a switch mechanism which is mechanically closed by a predetermined amount of rotation of the pendulum type mass member in the clockwise direction to detect a rotated state of the mass member by a predetermined amount as a keying signal, said switch mechanism including: a first movable piece abutted on the mass member to be bent by rotation thereof; and a first fixed contact to be brought into contact with the first movable piece, and second detection means is a switch mechanism which is mechanically closed by a predetermined amount of rotation of the pendulum type mass member in the clockwise direction to detect a rotated state of the mass member by a predetermined amount as a keying signal, said switch mechanism of the second detection means including: a second movable piece abutted on the mass member to sandwich the same with the first movable piece, and bent following the rotation of the mass member; and a second fixed contact to be brought into contact with the second movable piece.

15. A passive safety device for detecting impact acceleration applied to a vehicle by an acceleration detector, and protecting an occupant by an air bag, comprising:

a car compartment sensor for detecting the impact acceleration in a car compartment by use of said acceleration detector, said acceleration detector comprising a mass member arranged to be displaced in a direction corresponding to each

of the impact accelerations applied in two directions, and displaced from a predetermined position corresponding to the size of the impact acceleration, and detection means for detecting a state of displacement of the mass member by a predetermined amount or more as a keying signal and outputting the keying signal;

a vehicle side sensor for detecting impact acceleration applied to a side of the vehicle; and

a control unit for performing judgement control for development of the air bag based on the impact acceleration detected by the car compartment sensor, and impact acceleration applied to the side of the vehicle and detected by the vehicle side.